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April 17, 1990

TO: Minerals File

FROM: Holland Shepherd, Reclamation Specialist/Permit Lead HLS

RE: Subsidence Question, Cane Creek Mine, Moab Salt, Incorporated, M/019/005, Grand County, Utah

On April 6, 1990, Wayne Hedberg, Tony Gallegos and I met to resolve the question of subsidence monitoring at the Cane Creek mine site. The Division had originally asked Moab Salt to initiate a subsidence monitoring program. The operator felt this to be unnecessary and provided the Division with information supporting this position (see correspondence file dating August 1989 to this date). The operator contracted with a consulting firm, Schnabel Engineering Associates, to perform an engineer's report on the potential for subsidence over the mine. After evaluating this material and meeting with the Moab Salt staff and Schnabel Engineering staff on April 3, 1990, the Minerals staff has concluded that an ongoing subsidence monitoring program is unnecessary at this site. I have listed below some of the key elements to support this decision.

1. The Schnabel Engineering report indicates a worst case scenario of only 4 inches of subsidence for a 1,000 foot section of the Colorado River. Due to the size and dynamic nature of the river bed, this degree of subsidence would not result in an adverse impact to the river.

2. Most subsidence which would occur, has, probably, already occurred. If this is the case, then no adverse impacts on surface features are apparent. The mine has been operating since 1965 with no apparent adverse affects on the surface due to subsidence.

3. The operator has indicated that there will be no more development of the mine towards the river. In fact, the mine has been gradually closing or shrinking over time, decreasing the possibility of extending below the river, as was originally

feared. There is evidence to support the theory of mine contraction or shrinkage. According to the operator's records, the current injection/extraction ratio is .96, indicating that shrinkage in mine volume.

4. There are no apparent local or regional aquifers which would be negatively impacted by subsidence over the mine.

5. The depth of the mine varies between 2,500 and 3,000 feet. This mine depth limits substantially, the expression of subsidence and the surface. Also, three salt beds of the Paradox formation overly the mine. Salt, having a very plastic nature would limit the amount of subsidence above the mine.

jb
cc: Wayne Hedberg
Tony Gallegos
WMN/10-11